

NH 1465

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I

J. F. K. Federal Building, Boston, Massachusetts 02203-2211

MEMORANDUM

DATE:

SUBJECT: Temperature Effluent Limitations for PSNH-Merrimack
Station - Permit No. NH0001465

TO:

FROM:

The above referenced preliminary draft permit was submitted to the Water Quality Branch for the 14-day letter review on April 29, 1991. It was returned to me on May 23, 1991 with questions/comments. With the exception of effluent limitations considerations for the thermal plume, all other questions and comments have been resolved.

In an attempt to further discuss/resolve the issues associated with the potential impact of the heated effluent from the PSNH power station to the aquatic biota of the Merrimack River at Bow, NH, a meeting was held on July 8, 1991 in Concord NH. In attendance at this meeting were representatives from: the New Hampshire Department of Environmental Services (NHDES), the New Hampshire Fish & Game Department (NHFGD), the U.S. Fish & Wildlife Service (USFWS), and EPA. No resolutions were reached at this meeting with respect to specifying actual thermal limits for the heated effluent from the power station.

Since the meeting, the NHFGD recommended (see correspondence: D.A. Normandeau to R. Varney; July 20, 1991) that as a condition of the final permit, PSNH undertake studies to determine if thermal impacts adversely impact the fisheries of the Merrimack River. Also recommended was the condition that the target fish species of this study be the adult life stage of Atlantic salmon. Another recommendation was the establishment of a temperature criteria for the protection of Atlantic salmon as well as the protection of all other resident and anadromous fish species of the River.

The NHDES has submitted permit language (see correspondence: J. Andrews to N. Prodany; August 26, 1991), to be incorporated in the draft permit, relative to: 1) impingement studies, 2) pump entrainment monitoring, and 3) an evaluation of the impact of the thermal plume on anadromous fish.

Most recently, USFWS submitted their recommendations (see correspondence G. Beckett to D. Fierra; September 10, 1991). The USFWS believes that the thermal component of the effluent should

be regulated according to two temperature criteria - a T_{\max} value, and a delta-T. They have provided specific in-stream temperature tolerance data for fish species known and expected to occur in the project area. And they have also suggested a maximum delta-T of 2°C. However, it is unclear where this delta-T applies.

Regardless of interim T_{\max} and delta-T limits, both the USFWS and the NHFGD concur that limits for these parametric-temperatures should be specified for the adult Atlantic salmon and become applicable in 1997; that is, when the fish ladder at the Hooksett Dam is completed.

Although a review of the annual reports indicate that the surface temperature of the river at station (S-4) has exceeded a delta-T of 1°F, there are no data available to describe a temperature profile of a water column in this region, indicating the non existence of unaffected passageways below the thermal plume. In fact, there is no evidence in our files to indicate the occurrence of thermally induced-fish kills or other thermally induced-adverse impacts to the indigenous community of aquatic life in the river.

In conclusion, I am unable to determine either a T_{\max} effluent limit or a meaningful in-stream delta-T limit with the aforementioned information provided to me from NHDES, NHFGD or USFWS. For the T_{\max} , there is no mathematical transfer function that will enable me to determine an end-of-pipe temperature limit from an in-stream water quality criterion. Furthermore, there are no experimental data upon which an empirical function can be correlated to provide a discharge temperature limit. As for the single-valued delta-T limit, I believe it highly unlikely that one can limit such a complex physical system, where the seasonal temperature of the river changes by more than 45°F, with a single value and expect the power station to be in compliance. Therefore I am resubmitting the draft permit without temperature effluent limitations to the Water Quality Branch for their further review and technical input.